

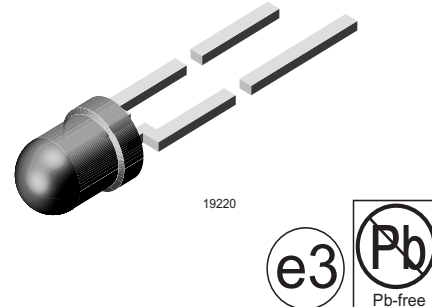
## High Efficiency LED, $\varnothing$ 3 mm Tinted Total Diffused Package

### Description

The TLH.46.. series was developed for applications which need a very wide radiation angle like backlighting, general indicating and lighting purposes.

It is housed in a 3 mm tinted total diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.

Several selection types with different luminous intensities are offered. All LEDs are categorized in luminous intensity groups. The green and yellow LEDs are categorized additionally in wavelength groups.



That allows users to assemble LEDs with uniform appearance.

### Features

- Choice of three bright colors
- Standard T-1 package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very wide viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- Lead-free device

### Applications

- Status lights
- OFF / ON indicator
- Background illumination
- Readout lights
- Maintenance lights
- Legend light

### Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity ( $\pm\phi$ )	Technology
TLHR4600	Red, $I_V > 1$ mcd	60 °	GaAsP on GaP
TLHR4601	Red, $I_V > 1.6$ mcd	60 °	GaAsP on GaP
TLHR4605	Red, $I_V > 2.5$ mcd	60 °	GaAsP on GaP
TLHY4600	Yellow, $I_V > 0.63$ mcd	60 °	GaAsP on GaP
TLHY4601	Yellow, $I_V > 1$ mcd	60 °	GaAsP on GaP
TLHY4605	Yellow, $I_V > 2.5$ mcd	60 °	GaAsP on GaP
TLHG4600	Green, $I_V > 1$ mcd	60 °	GaP on GaP
TLHG4601	Green, $I_V > 1.6$ mcd	60 °	GaP on GaP
TLHG4605	Green, $I_V > 4$ mcd	60 °	GaP on GaP

### Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

TLHR46.., TLHY46.., TLHG46..,

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		$V_R$	6	V
DC Forward current	$T_{amb} \leq 60\text{ }^{\circ}\text{C}$	$I_F$	30	mA
Surge forward current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	1	A
Power dissipation	$T_{amb} \leq 60\text{ }^{\circ}\text{C}$	$P_V$	100	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	- 20 to + 100	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 55 to + 100	$^{\circ}\text{C}$
Soldering temperature	$t \leq 5\text{ s}$ , 2 mm from body	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance junction/ ambient		$R_{thJA}$	400	K/W

### Optical and Electrical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

#### Red

TLHR46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	TLHR4600	$I_V$	1	2		mcd
		TLHR4601	$I_V$	1.6	3.5		mcd
		TLHR4605	$I_V$	2.5	6		mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	612		625	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		635		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 60$		deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$		2	3	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0$ , $f = 1\text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

#### Yellow

TLHY46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	TLHY4600	$I_V$	0.63	2		mcd
		TLHY4601	$I_V$	1	3.5		mcd
		TLHY4605	$I_V$	2.5	5		mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	581		594	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		585		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 60$		deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$		2.4	3	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0$ , $f = 1\text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

## Green

### TLHG46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10 \text{ mA}$	TLHG4600	$I_V$	1	2		mcd
		TLHG4601	$I_V$	1.6	3.5		mcd
		TLHG4605	$I_V$	4	6		mcd
Dominant wavelength	$I_F = 10 \text{ mA}$		$\lambda_d$	562		575	nm
Peak wavelength	$I_F = 10 \text{ mA}$		$\lambda_p$		565		nm
Angle of half intensity	$I_F = 10 \text{ mA}$		$\varphi$		$\pm 60$		deg
Forward voltage	$I_F = 20 \text{ mA}$		$V_F$		2.4	3	V
Reverse voltage	$I_R = 10 \mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0, f = 1 \text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

### Typical Characteristics ( $T_{amb} = 25^\circ\text{C}$ unless otherwise specified)

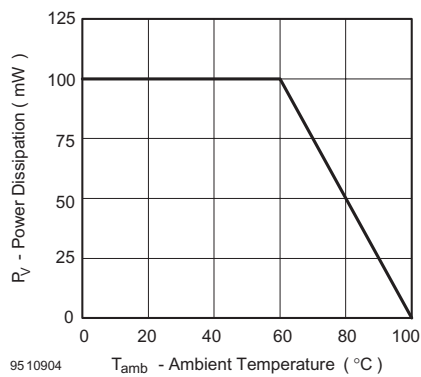


Figure 1. Power Dissipation vs. Ambient Temperature

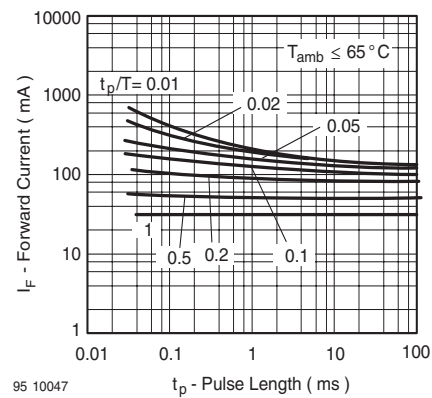


Figure 3. Forward Current vs. Pulse Length

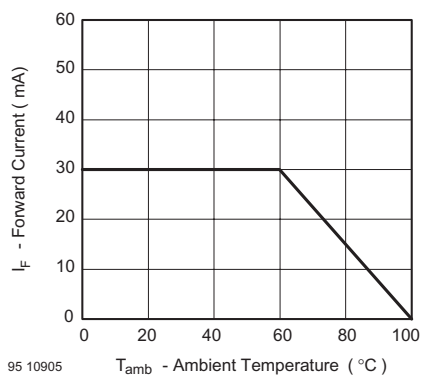


Figure 2. Forward Current vs. Ambient Temperature for InGaN

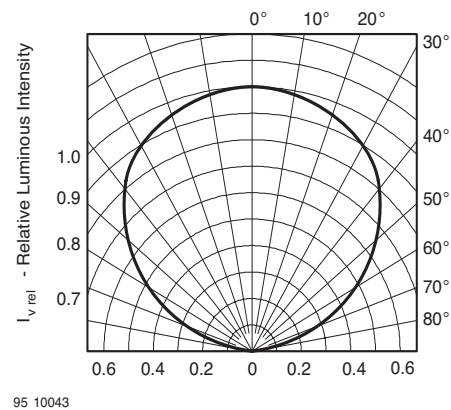


Figure 4. Rel. Luminous Intensity vs. Angular Displacement

## Package Dimensions in mm

